

WHAT IS CLAIMED IS:

1. A surface acoustic wave filter comprising:
a piezoelectric substrate; and
a plurality of one-terminal-pair surface acoustic resonators disposed on said piezoelectric substrate, each of the plurality of one-terminal-pair surface acoustic resonators including interdigital electrodes disposed on said piezoelectric substrate, and an insulating film deposited on and adhered to the interdigital electrodes;

wherein at least one of said plurality of one-terminal-pair surface acoustic resonators is a series arm resonator, and at least one of the remaining one-terminal-pair surface acoustic resonators is a parallel arm resonator,

the series arm resonator and the parallel arm resonator are coupled in a ladder arrangement, and

the electrode duty of the series arm resonator is greater than the electrode duty of the parallel arm resonator, the electrode duty of a one-terminal pair surface acoustic resonator being defined by the following equation (1):

$$\text{electrode duty} = 2 \times W/\lambda \quad \dots(1)$$

where λ denotes the wavelength of the one-terminal-pair

surface acoustic wave resonator, and W denotes the line width of an interdigital electrode.

2. A surface acoustic wave filter according to Claim 1, wherein the piezoelectric substrate is a 36° rotated Y-cut X-propagation LiTaO₃ substrate.

3. A surface acoustic wave filter according to Claim 1, wherein the thickness of the electrode in each of the SAW resonators is about 9.2% of the average wavelength of the series arm resonators and the parallel arm resonators.

4. A surface acoustic wave filter according to Claim 1, further comprising reflectors arranged at both ends of the interdigital electrodes.

5. A surface acoustic wave filter according to Claim 1, wherein the insulating film is SiO₂.

6. A surface acoustic wave filter according to Claim 1, wherein the surface acoustic wave filter is a receiver RF filter.

7. A surface acoustic wave filter according to Claim 1, wherein the thickness of the insulating film has a dimension

that achieves a predetermined frequency characteristic.

8. A surface acoustic wave filter according to Claim 1, wherein the electrode duty of at least one series arm resonator is about 0.5 or less.

9. A communication apparatus comprising at least one surface acoustic wave filter according to Claim 1.

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